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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/611,483 | 07/01/2003 | Michael Geva | TRIQ-121076C1 | 3308 |

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| EXAMINER | |
|---|---|
| WANG, GEORGE Y | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2871 | |

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/611,483 | GEVA ET AL. | |
| | Examiner | Art Unit | |
| | George Y. Wang | 2871 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *09 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnham et al. (U.S. Patent No. 4,546,480, from hereinafter "Burnham") in view of Beernink et al. (U.S. Patent No. 5,708,674, from hereinafter "Beernink").

Burnham discloses an electronic device and method of making an electronic device having an active region (fig. 4, ref. 38) located over a substrate (fig. 4, ref. 32).

Burnham teaches an undoped layer with a barrier region made up of a number of barrier layers between a plurality of undoped layers (col. 5, lines 48-56).

However, the reference fails to specifically disclose that the active layer is under the barrier layer.

Beernink discloses an electronic device having an active layer (fig. 3, ref. 13) situated beneath a barrier layer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have disposed to the active layer beneath the barrier layer since one would be motivated to create a device with minimal layers (col. 2, lines 30-35). By preventing unwanted layers, fabrication would not only be more cost effective and more readily manufactured, it would prevent unwanted introductions of impurity. This would ultimately enhance reliability and minimize accompanying drawbacks (col. 3, lines 1-4).

3. Claims 2-8 and 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnham et al. (U.S. Patent No. 4,546,480, from hereinafter "Burnham") in view of DePoorter (WO 97/50133).

Burnham discloses an electronic device and method of making an electronic device having an active region (fig. 4, ref. 36) located over a substrate (fig. 4, ref. 32). Burnham teaches an undoped layer with a barrier region made up of a number of barrier layers between a plurality of undoped layers (col. 5, lines 48-56). Furthermore, the reference discloses barrier layers composed of aluminum arsenide with 5-50% aluminum composition (col. 5, lines 48-56), and having a thickness of about 1 nm and

where the undoped layers each have a thickness of about 10 nm (col. 1, lines 23-34). The Burnham reference also teaches that there are no p-n junctions between the barrier and doped cladding.

Although the reference teaches a doped upper cladding (fig. 4, ref. 41), Burnham does not disclose it as being doped with zinc. Furthermore, the reference does not specifically teach the barrier region inhibiting the diffusion of zinc into the active region.

DePoorter discloses a semiconductor diode with an upper cladding doped with zinc (abstract). Furthermore, the reference teaches a barrier region that inhibits the diffusion of zinc into the active region (pg. 3, lines 21-35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have doped the upper cladding with zinc and to construct zinc-inhibitive properties to the barrier layers since one would be motivated to alternatively have a high and low bandgap value (pg. 3, lines 21-35). Such values render the barrier layers highly effective and reliable in practice since zinc-inhibition in the layers encourage highly thin layers that have mechanical stress without the defects caused by degradation of charged ions, such as zinc atoms (pg. 3, lines 21-35).

4. Claims 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (U.S. Patent No. 5,212,704, from hereinafter "Chen") in view of Burnham and Beernink.

Chen discloses an optical fiber communication system (fig. 8, ref. 80) with a transmitter (fig. 8, ref. 81) and a receiver (fig. 8, ref. 85) connected by an optical fiber

(fig. 8, ref. 831). In addition, the system includes a source (abstract). Although Chen discloses an electronic device embedded in the transmitter or receiver, the reference fails to specifically disclose an electronic device having an active region located over a substrate, an undoped layer having a barrier region of multiple barrier layers, and each including aluminum, and a doped upper cladding layer located over the barrier region.

Burnham and Beernink disclose an electronic device having an active region located over a substrate, an undoped layer having a barrier region of multiple barrier layers, and each including aluminum, and a doped upper cladding layer located over the barrier region as recited above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the electronic device of Burnham since one would be motivated to reduce and eliminate defects in manufacture and variations due to high laser temperatures (col. 2, lines 41-68).

***Double Patenting***

5. Claims 1-20 of this application conflict with claims 1-20 of Application No. 09/757,099. 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

Claims 1-20 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-20 of copending Application No. 09/757,099. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: "an electronic device comprising an active region located over a substrate, an undoped layer located over the active region, and a doped upper cladding layer located over the undoped layer, wherein a barrier region including aluminum is located between the updoped layer and the doped upper cladding layer."

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

***Response to Arguments***

6. Applicant's arguments filed August 9, 2004 have been fully considered but they are not persuasive.

Applicant's main argument is that the cited prior art references fail to disclose the elements of the claimed invention. Applicant goes to great length to argue that the

Burnham reference does not teach a diffusion barrier layer. Then, Applicant argues, in the alternative, that if Burnham does teach a diffusion barrier layer, then it does not teach an active layer and asserts that "the Examiner is not allowed to ascribe one feature dual purposes." Applicant asserts that the barrier region cited in the Burnham reference is not a barrier region because Burnham refers to them as "active layers." While Burnham may call them "active layers," Examiner points to the fact that nothing in Applicant's claims distinguishes the structure of Applicant's diffusion barrier layers with the active layers of Burnham. In fact, they appear to be made of the same materials consisting of aluminum composite.

Furthermore, in response to Applicant's alternative argument that "the Examiner is not allowed to ascribe one feature dual purposes," Examiner makes it clear that nowhere is this supported in the MPEP. Even assuming that the argument is valid, Examiner asserts that the Burnham reference clearly distinguishes an "active region" (fig. 4, ref. 38) and a separate diffusion barrier layers (fig. 4, ref. 36). As such, Examiner notes that Applicant's amendment and argument does nothing to distinguish the claimed invention from the prior art references since the Burnham reference clearly teaches the same structures as that claimed by Applicant.

Applicant also argues that the Beernink and DePoorter references fail to correct the deficiencies of Burnham. However, Applicant offers nothing to support this contention other than stating that "a teaching of situating an active layer beneath the diffusion barrier layer is far from that which is presently claimed" and they "fail to teach

or suggest" the diffusion barrier element. As such, Examiner finds the argument unpersuasive.

As to Applicant's remarks regarding claims 17-20, Examiner considers them moot since the previous Office Action clearly rejected the claims with Chen et al. (U.S. Patent No. 5,212,704, from hereinafter "Chen") in view of Burnham and Beernink, which is repeated in this Office Action.

Therefore, Examiner holds to the validity of the references and maintains rejection.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Y. Wang whose telephone number is 571-272-2304. The examiner can normally be reached on M-F, 8 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 571-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

gw
October 28, 2004

ROBERT H. KIM
SUPERVISORY PATENT EXAMINER
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